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USDA's Role In Marketing

By Earl L. Butz

The job of marketing farm commodities today is a challenging one. How well it is performed is of vital concern not only to those who carry it on, but also to farmers and consumers.

It is the policy of the U. S. Department of Agriculture to give high priority to marketing work. In fact, marketing in all its important phases now is receiving greater emphasis in the Department than ever before.

The basic responsibility for doing the marketing job, however, must always rest squarely in the hands of private enterprise. The role of Government in marketing is to do the research, to render service, and to help private enterprise do a better job.

Marketing of food and other farm products has become increasingly complex. The marketing system does considerably more today than it did just a few years ago. A familiar example is the marketing of wheat. No so long ago it was made into flour; the homemaker bought the flour and that was the end of the marketing job. Now the flour goes into bakeries and they make it into breads, cakes, and pastries. Or, perhaps many other ingredients are carefully blended with the flour to make ready-to-use cake and pastry mixes. This elimination of housework in the preparation of foods has been extended to many other products, and particularly in the frozen food field.

All this additional service has added to the cost of marketing. It has forced vast changes in equipment and facilities, required greater investment of capital, and demanded new technical knowledge and improved skills. It has meant the employment of more labor to perform the additional work in handling, processing, packaging, and providing the multiplicity of other services that have been introduced into the marketing system. The labor force in the marketing of farm food products alone has increased from about three million to nearly five million workers within a period of a couple of decades. During this period of expansion in the number of workers in the marketing system, the number of workers required to produce the various crops on our farms has declined by about four million. Recognizing this trend, the organization of the Department of Agriculture has been changed recently to help more effectively with the larger and more complex marketing job. The Agricultural Marketing Service and the Foreign Agricultural Service are the two Department agencies which carry the main responsibility.

Domestic phases of marketing are handled by the Agricultural Marketing Service. This agency is engaged in such activities as marketing re-

search and development, crop and livestock estimates work, economic analyses, and marketing services such as market news, standardization, inspection and grading. It is also responsible for authorized regulatory measures governing trade and other practices, marketing agreements and orders, surplus removal and diversion operations, the School Lunch Program, related food distribution programs, and for cooperating in trade promotion and merchandising of plentiful foods. All of these activities have the common purpose of further improving and developing the marketing and distribution of agricultural products.

Essentially, these activities are carried on to serve and help private enterprise perform the marketing function more satisfactorily. Examples of this are such services as grading, inspection, standardization, and market news. The bulk of our agricultural production is covered in one way or another by them. These marketing services are generally recognized in trade and commerce as essential for day-to-day operations. Without them many business transactions would have to be carried on in a much less orderly manner than now.

Services Are Many and Varied

Some idea of the scope of these services may be gained from a few examples of the Department's work during the last fiscal year. More than 15½ million samples of cotton were classified in terms of the official United States grade standards. Inspection service was maintained on all of the 171 established tobacco auction markets, comprising 959 different warehouses. Tobacco inspected for grade totalled about 2 billion pounds, 100 percent of all the tobacco sold at auction. Over 2 million inspections of grain were made which involved approximately 4 billion bushels of all kinds of grains. Approximately 1,300,000 carloads of fresh fruits and vegetables were inspected. About 7½ billion pounds of meat, largely beef, veal and lamb, were graded or certified.

Another important aid in the marketing of agricultural products is the market news service which gathers and disseminates current information on prices, demand, and other market conditions. This service functions through more than 140 reporting offices which are linked by a teletype network of 11,000 miles of leased wire through which market information flows each week-day for general distribution. This information is taken to farmers, businessmen, consumers and others by practically every available means of communication. It is carried regularly by more than 1,400 radio stations and about 12,000 daily newspapers in all parts of the United States.

A vast new store of useful information and dollar-saving techniques designed to improve and maintain quality, expand outlets, and increase marketing efficiency for agricultural products is being developed through the Department's program of marketing research. Much of this work is being done in cooperation with other public and private agencies. The marketing research now under way involves more than 300 different studies and activities covering a wide range of commodities and problems which touch many specialized fields of economic, biological, and physical science. While the work being done is significant in terms of results, the market-

ing research program itself is a modest one. Only about 12 percent of the total funds available for all agricultural research in the Department is devoted to marketing research.

Marketing agreements and orders are another type of activity designed to promote orderly marketing conditions. The handling of fruits and vegetables in different parts of the country is regulated through 27 marketing-agreement-and-order programs. The estimated value of the commodities covered by these programs exceed \$600 million. There are 53 fluid milk markets operating under Federal orders. The volume of milk marketed under these programs last year approximated 27 billion pounds.

Through the National School Lunch Program the market for farm products is being enlarged while at the same time the diet of the nation's school children is improved. In addition, Congress provided in the Agricultural Act of 1954 for a new program to increase the consumption of fluid milk by children in schools of high-school grade and under.

Surpluses Are Our Greatest Challenge

These are some of the services provided by the Department of Agriculture. Another part of the current marketing job that has to be done is to move into consumption some of the surpluses that have accumulated. The Commodity Credit Corporation has invested in commodity loans and stocks in excess of \$6 billion dollars. About \$3,700,000,000 worth of commodities are owned by CCC. This big accumulation, although in the hands of a government agency, presents private trade with an unprecedented challenge and opportunity for the exercise of individual initiative and ingenuity to merchandise and sell both at home and abroad.

In the disposal of its holdings, it is the CCC's general policy to work through private trade. As in the past the government will seek markets here at home for some of our agricultural surpluses without undermining price support operations. For the big bulk of our surplus holdings, however, we obviously must look to foreign outlets and develop whatever possibilities they have. Many countries of the world have real need for additional food.

The Foreign Agricultural Service is the agency within the Department which is charged with the main responsibility of carrying on the Department's activities in maintaining and developing foreign markets.

As a means of bolstering our foreign markets for farm products the recent Congress enacted the Agricultural Trade Development and Assistance Act of 1954. This is a very significant piece of legislation, since it enables foreign countries to utilize their own currencies to buy American farm products in addition to what they can now purchase for dollars.

In all of its domestic and foreign marketing activities the Department is moving forward with the realization that if this country is to make full use of its vast capacity to produce, the marketing system must provide the means and the incentives to move the products from our farms into the hands of consumers at home and abroad.

Cutting Marketing Costs Through Research

By W. C. Crow

Marketing losses in food and farm products run into hundreds of millions of dollars annually. These losses occur at all stages of marketing - in assembling, during transportation and distribution, on terminal and other markets, and in wholesaling and retailing.

Some of these losses are waste due to lack of protection, lack of knowledge, and plain carelessness. But there are other large losses through inefficiencies - outmoded facilities, poor equipment, improper use of labor, and obsolete handling techniques. Both add to the cost of marketing, and both are being reduced by USDA research.

The agency in the Department responsible for research to develop improved methods, equipment, and facilities for transportation, handling, storage, and distribution of farm and food products is the Transportation and Facilities Branch of the Agricultural Marketing Service. The Branch works in close cooperation with other USDA agencies, State marketing agencies, agricultural colleges and experiment stations, farm groups, shippers, transportation agencies, warehouse and storage organizations, equipment and container manufacturers, wholesalers, retailers, and other concerned with improvements in marketing.

The programs of the Branch consist primarily of: (1) Developing plans for marketing facilities for handling farm and food products in producing areas, at concentration points, and on terminal and secondary markets; (2) determining best methods, equipment, and equipment uses for handling products at the various stages in marketing and in packing line operations to reduce labor and other operating costs and minimize loss and damage to products; (3) improving transportation facilities, methods, equipment, practices and operations; and (4) finding improved methods of wholesaling, packaging, and retailing.

The Agricultural Marketing Act of 1946, among other things, directs USDA to help develop plans for efficient facilities for the assembly, processing, transportation, storage, distribution, and handling of agricultural products. In compliance with this directive, much of the work of the Branch has been directed at the planning of marketing facilities. Included in this work have been large city wholesale markets for fruits, vegetables, poultry, eggs, meat, frozen foods, butter, cheese and other perishables; warehouses; livestock auctions; elevators, packing and shipping sheds; farmers' markets; egg assembly plants and other facilities.

New marketing facilities have been planned for more than 70 localities in more than half of the States and Puerto Rico. Of the projects planned by the Branch, over half have been constructed or are under construction, and in the case of many others, construction is expected to start soon. While a list of all of the facilities planned by the Branch would be too lengthy, some idea of their scope can be had by referring to the large produce markets in Savannah, Hartford, Indianapolis, and Louisville and State Farmers' markets in Texas, Florida and South Carolina.

Other activities of the Branch include research in materials handling, transportation, packaging, and wholesaling and retailing. A resume of some of this work - completed, underway and planned - follows:

Handling and Facilities Research

Much of the work in marketing agricultural products is the physical handling required to move them into, within, and out of marketing and storage facilities. This work is known as "materials handling," and in certain stages of agricultural marketing it accounts for as much as 85 percent of the total labor employed. Research to develop improved work methods and equipment can reduce these labor requirements considerably.

In many instances substantial cuts in labor can be made merely by changing the organization of the work - by using the proper size of crew, "balancing" the crew to properly distribute work among its members, increasing the amount of equipment used, and handling loads as units. For instance, in cotton compress operations it was possible to reduce direct labor costs 25 percent. By rearranging the handling of cotton by workers using two wheel hand trucks, the work crew was cut from 8 to 6 members with no loss in the amount of work accomplished.

New Equipment Developed

In other cases available equipment is not suited for specific jobs and new machines must be developed. This is particularly true in the preparation of products for market where labor requirements are high, and a large number of operations such as dumping, cleaning, sorting, sizing, packing, labelling, and tallying are necessary. Here research is directed not only to reducing labor and equipment cost, but also to minimizing spoilage and waste. In apple handling operations alone, a new mechanical lift to "high pile" and "break-out" stacks of boxed apples was developed that does the work at less than half the cost of doing it manually and a "float roll" sorting table was evolved which reduces the labor necessary for grading 60 percent under that needed on the best sorting table currently used. Projects now underway in this field are in apple packinghouses, potato packing plants, poultry dressing plants, and fluid milk plants.

Millions of dollars are invested annually in new marketing and storage facilities. These facilities are built to provide additional space, reduce handling costs and provide conditions which will minimize spoilage and waste. To do this they must be properly designed - structurally, functionally, and economically. In this field current projects cover work

on cotton compresses and warehouses, egg assembly plants, wholesale produce stores, and market sales sheds for farmers and truckers. Other work is being done to develop better methods and equipment for "conditioning" agricultural products for storage. Here, projects are underway on grains and seeds, apples and other deciduous fruits and white potatoes.

Transportation and Packaging Research

Transportation research goals are: (1) economic appraisal and analysis of trends in transportation costs, charges for service, equipment and facilities and their effects on marketing of agricultural products and prices received by farmers; (2) reduction of losses and waste in transit; (3) improvement of rail and truck equipment and facilities to improve service and reduce costs; and (4) increased utilization of carrier equipment.

Increased use of motortrucks in the movement of farm products has had a profound effect upon marketing methods. Data have been gathered on how much traffic moves by rail and trucks, and why, and how changes in mode of transportation has affected marketing of such products as grain, citrus products, apples and other fresh fruits and vegetables. Another study is being made of differences in taxes, size and weight limitations, and reciprocity between the various States and effects of these factors on the marketing of food and farm products.

Loss and damage claims paid by carriers are reflected in freight rates paid by shippers, and on some commodities these damages run high. Damage claims on watermelons moved by railroads in 1952 averaged \$50.66 per car. USDA research demonstrated that damage to long-type watermelons such as the Congo could be reduced two-thirds by loading them crosswise instead of lengthwise in cars. Similar savings resulted from loading cantaloup crates on end. Transit losses have been reduced or shipping costs have been cut on lettuce, broccoli, cauliflower, and eggs moving by rail. Tests are now underway on different spring suspensions for truck trailers to cut losses in egg grades during transit and to develop a non-slip flooring to reduce death and bruising losses to livestock from falling in trucks and railroad cars. Considerable research has been done on motortruck and rail refrigeration equipment and use and a study is planned on equipment used for delivery of frozen foods from warehouses and distributing plants, where frequent opening of refrigeration unit doors is necessary.

Better Packages Developed

Research to improve packaging of agricultural products has as its objectives: (1) development of improved or cheaper packages or containers; (2) economic evaluation of types, sizes and designs of containers; (3) increased efficiency of packaging operations; and (4) standardization and simplification of containers.

Packaging of fresh fruits and vegetables and meats in consumer units has been assisted and facilitated. Research on prepackaging apples and carrots in film bags was undertaken long before commercial adoption of this method. Evaluation of new packages is undertaken by actually packaging and marketing products under commercial conditions and then deter-

mining such facts as cost, efficiency, acceptance and economies to growers, producers, or distributors.

Wholesaling and Retailing Research

Wholesale and retail distribution account for about one-half of the total costs of marketing farm products and offer broad fields for economies and efficiencies. Research in these fields generally is aimed at: (1) Handling efficiencies; (2) trade relationships and functional coordination; and (3) personnel management. Most of the work is done in retail stores and wholesale warehouses with USDA furnishing the research technicians and the trade furnishing the facilities.

Studies primarily are of functions, such as the check-out operation in retail stores or order handling in wholesale warehouses. Briefly, such operations are studied to determine the best current method; an effort is made to improve that method, and the improvement is tested under actual operating conditions in stores or warehouses.

More Efficient Retailing

Despite many improvements, retailing is still the most costly step in food marketing. Early research in this field covered the check-out operation in self-service food stores - a function that takes more than 20 percent of total man-hour requirements and a bottleneck most customers resent. A new check-out counter was developed which increased by 38 percent the number of customers handled in an hour, at a decreased cost of 26 percent per order. Another study increased the efficiency of unloading, handling, storing, price marking and shelf-stocking groceries in retail stores by 68 to 86 percent. Labor productivity in meat handling in self-service stores was increased 25 percent through use of better methods, equipment, and layout developed in another project.

Research underway on produce handling in retail stores is directed at improvements in: receiving and storage; preparation for display; packaging weighing and pricing; displaying and service. Work is also underway to improve methods and equipment in retailing frozen foods.

Personnel management work in retail food stores has dealt with improving the performance of cashiers and grocery clerks through better training. Another study is underway to improve supervision and supervisory skills.

Wholesaler Studies

In the development of closer relationships between wholesalers and retailers, several studies have been made on such subjects as: methods of handling and delivering orders; how some wholesalers build better retailers; and the views of independent grocers on wholesaler-retailer relationships. A report is now being written on methods of increasing productivity in modern grocery warehouses. Work has just been started on improved methods of handling dairy products in wholesale warehouses and in retail stores. It will cover packaging, handling, and other functions at the wholesale and retail level.

Improved Turkey Slaughter

By Edwin E. Drewniak, Edward R. Baush, and Lyle L. Davis

An improved method of turkey slaughter, combining humaneness with quality protection, has been found to have commercial possibilities in research recently completed by the Biological Sciences Branch of the Agricultural Marketing Service, USDA. The process provides for completely immobilizing the birds before they enter the processing line by gassing them with carbon dioxide (CO₂).

Further research is underway on the practical application of the method in turkey processing plants to perfect it for commercial use. Studies so far, under actual plant operating conditions, have shown that turkeys can be immobilized effectively with carbon dioxide gas when the proper combinations of gas concentration and exposure time are used.

Concentrations of gas and time intervals for exposure of birds are both limited to a very narrow range and were worked out after a great deal of difficulty. Gas concentrations above 77 percent and below 73 percent CO₂ are apt to kill the birds before they travel the slaughter line. The optimum gas concentration in the tests was 75 percent CO₂. Exposure time for birds at this concentration not only differs for varieties of turkeys, but also varies for males and females within a variety. Within a variety and sex, light weight birds are immobilized more quickly than heavier ones. Turkeys in their normal upright condition are more quickly immobilized than those hung head down. (A table showing the range of exposure time, at 75 percent CO₂, is shown for males and females of 3 popular turkey varieties on the final page of this article.)

Loss of grade in processed turkeys is a serious economic concern of turkey processors. Reasons for loss of grade are many. Too often, however, the bruises, dislocated and broken bones, torn and abraded skin and other defects are the direct result of the struggles of the large and excitable birds during removal from coops, during shackling, sticking and bleeding. If it were possible to immobilize turkeys before they enter the processing line, that is before they are hung on shackles, or even before they are removed from coops, handling problems should be minimized and the number of downgraded carcasses decreased.

Several methods of immobilizing animals before slaughter have been used with varying degrees of success; stunning, electric shocking, debraining, and the more recent carbon dioxide immobilization used successfully on hogs. Of these, the latter appeared more adaptable to "before the line" application in poultry processing plants. A study was made to observe the effects of CO₂ on live turkeys and to determine whether they could be immobilized by this gas.



A turkey being placed in the test chamber.

In the tests, a wooden chamber, 2 feet wide, 4 feet deep, and 12 feet long, with doors at the top and both ends, was used for gassing the birds. A variable-speed conveyor ran the length of the inside. Concentrations of gas, from a standard CO₂ cylinder, were introduced in controlled amounts into the chamber. The equipment was set up in a commercial processing plant near the place where the birds were hung on shackles, allowing close adherence to commercial practices. No special selection was made of turkeys for the tests, but unhealthy or otherwise unrepresentative birds were excluded. A total of 475 toms and hens were used.

With concentrations of gas in the chamber at desired levels, the conveyor was put in motion. One bird at a time was weighed and put into the chamber. Timing was started the moment the bird's head was beneath the top of the load opening. The bird was removed immediately after expiration of the desired exposure time and inspected for immobilization. A bird was judged effectively immobilized when it displayed complete lack of movement, closed eyes, limpness, and a detectable heart pulsation during the passage through shackling, sticking, bleeding and dry feather pulling operations.

Every turkey effectively immobilized during the tests was carefully inspected after evisceration, for detrimental effects resulting from the treatment. No defective birds were found.

Simple exposure of turkeys to the gas was not successful. Instead, proper combinations of gas concentrations and times of exposure had to be determined and utilized.

Too high gas concentrations - above 77 percent - killed turkeys violently and quickly. Too low concentrations - those below 73 percent - also were dangerous. Here, the trouble was the longer exposure time necessary to induce unconsciousness. The CO₂ build up killed some of the birds before they got through the slaughter and picking line.

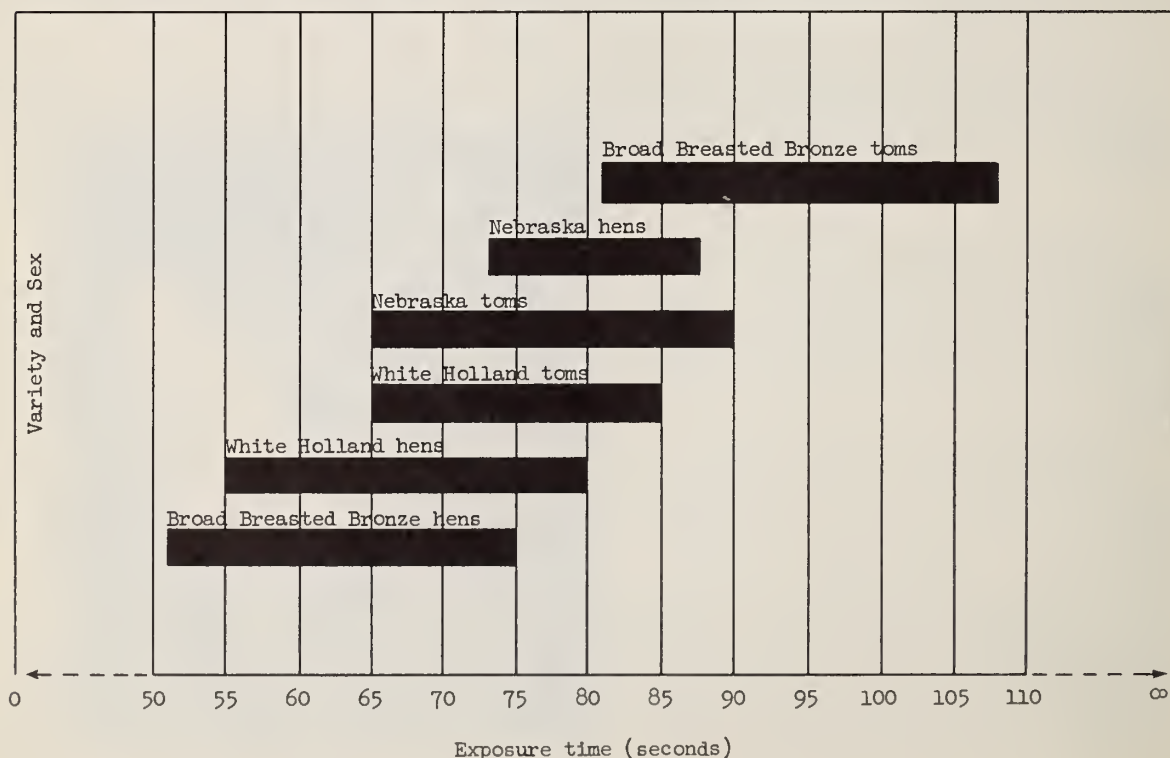


A successfully immobilized turkey.

It appears that the air sacs and hollow bones of turkeys may interfere with the immobilizing action of CO₂ initially, and with the recovery of the birds after immobilization. At concentrations below 73 percent CO₂, the birds seemed able to resist unconsciousness for a considerable time. The delay may have been caused by residual oxygen in bones and air sacs. Conversely, the recovery of consciousness by immobilized birds appeared to be delayed to the extent that some of them never recovered. In these cases, it appeared that the residual CO₂ in bones and air sacs affected recovery. In the effective ranges - 73 to 77 percent - gas concentrations evidently were great enough to balance and overcome the effects of residual oxygen fast enough to cause immobilization, without being so great as to cause death.

Possible Commercial Application

In considering the possible commercial application of the immobilization process, which would require sufficient flexibility for coordination of plant operations, the exposure times at 75 percent CO₂ concentration were selected for graphing. The six intervals shown in the table below were greater than at any other concentration tested and should satisfy commercial requirements best. However, the concentration of CO₂ and time of exposure determined in these tests may not be the proper combinations for use in all places and on all turkeys. Temperature, method of handling live birds in transit to plants, condition of the birds, varieties and other variables may very well affect the physiological condition in which turkeys reach the immobilization chamber. Further research, now underway, may bring the answers to some of these problems.



Intervals of exposure times during which turkeys of different varieties and sexes were successfully immobilized when concentration of carbon dioxide was at 75 percent.

Gas Ripening Tomatoes

By W. A. Radspinner

An effective method of accelerating the ripening of tomatoes for prepackaging with ethylene gas, which reduces by a third to a half the time normally required for the process, has been demonstrated through USDA research. The faster ripening method should be of considerable importance to prepackagers, particularly during periods of active markets or when ripening-room space is limited.

The new ethylene gas technique is an improvement on present practices in which no ethylene gas is used. Briefly, it consists of gassing tomatoes with 1 part ethylene to 5,000 parts air daily, for 4 to 5 days, in closed storage where temperatures are held at 68 to 70 degrees Fahrenheit. To prevent oxygen depletion and carbon dioxide accumulation, the storage room is ventilated a few minutes prior to the daily applications of gas.

Fifty percent of the green tomatoes so treated should ripen enough for prepackaging in 4 to 5 days as compared with the 6 to 7 days required for the same amount of ripening without use of ethylene gas. In addition, the amount of decay in tomatoes was very low during tests of the improved gassing method.

Research under which the new gassing technique was developed was carried out by the Biological Sciences Branch, Agricultural Marketing Service, USDA. It was a follow-up on the faster ripening of tomatoes through controlled refrigeration during shipping, reported in the October 1954 issue of *MARKETING ACTIVITIES*.

The gas-ripening research study also revealed that while tomatoes stored for ripening normally liberate some ethylene, the concentration developed apparently is not enough to be of material value in commercial ripening rooms. Further, in measuring these normal concentrations of ethylene from ripening tomatoes it was found that in 4 days the oxygen in closed ripening rooms had dropped to 14 percent and breathing was difficult. It is possible that this depletion of oxygen (with the accompanying build up of carbon dioxide) retarded the rate of ripening and thus nullified any increase that might have been obtained from normal ethylene concentration.

The study to determine the possible value of added ethylene in commercial ripening rooms consisted of 8 tests during 1953 and 1954, with green fruit from the original sortings of 6 shipments of tomatoes from Florida and 2 from Texas. In each test 2 or 3 lots were gassed with ethylene in a wooden walk-in refrigerator while a check lot was held at the same temperatures - from 65° to 68°F. - in a commercial ripening room, with a relative humidity of 80 to 90 percent.

In the tests, ethylene was applied at 24-hour intervals through a pipe in the wall of the storage chamber. Prior to each application the room was opened and ventilated a few minutes. Test lots were gassed from 2 to 7 days. At the end of each scheduled gassing period, each lot was placed with its check lot until the sixth or seventh day when all lots were inspected.

Inspection consisted of sorting the tomatoes into "ripe", "unripe", and "decayed" during the first 3 tests. In the other 5 tests, "unripe" fruit was divided into "turning" and "green". The "ripe" group consisted of tomatoes with 50 percent or more red color, the stage at which tomatoes are considered ripe enough for prepackaging. A panel of judges then compared the test and check lots for color, taste, and texture.

Test Results

The first 3 tests with Florida tomatoes showed marked benefits from the use of ethylene gas, with 4 days of treatment much better than 2 and almost as good as 7. Lots treated 4 or 7 days had an average of 50 percent more ripe fruit than their respective check lots. Decay was relatively low in all tests.

The later 5 tests (3 with Florida and 2 with Texas tomatoes) confirmed that ripening was greatly speeded by use of ethylene gas. Here, a 3-day treatment accelerated ripening nearly as fast as the 6- or 7-day treatments. Decay was very low in these tests also.

Generally, the tests showed that use of the ethylene-gas technique substantially increased ripening of mature-green tomatoes. Ethylene applications for only the first 3 or 4 days gave nearly as good results as longer applications. The study indicated that lots of tomatoes treated with ethylene 3 or more days would have half of the fruit ripe enough for prepackaging nearly 2 days earlier than untreated fruit. Treated tomatoes colored evenly to the center and were equal or superior to the check fruits in flavor, color, and texture.

Other Findings

Higher concentrations than 1 to 5,000 parts ethylene to air are neither necessary nor recommended. Concentrations higher than 1 to 1,000 have been reported to injure tomatoes and retard ripening. Still higher concentrations are explosive.

While the optimum temperature for ripening tomatoes is 65° to 68°F., rate of ripening increases with temperatures up to about 75°F. Since ethylene is used primarily to speed ripening, its use should be more practical at temperatures approximately 68° to 70°F.

Ripening rooms properly constructed for temperature control are tight enough for gassing and need only to be made spark proof and equipped to admit the gas. Banana ripening rooms sometimes are equipped for ethylene and may be used for ripening tomatoes. Ethylene in high concentrations is very explosive. It should be used with caution.

Faster Price Marking

By Paul F. Shaffer and Dale L. Anderson

Retailers who now mark prices on grocery items with crayons or grease pencils can save as much as $10\frac{1}{2}$ hours per 1,000 cases of groceries by switching to the use of improved stamping equipment. At the same time, the resultant more legible price marks on grocery items will assist customers in their shopping and expedite "check-out" by store cashiers.

This was found in a study of ways to improve retail marketing and reduce its costs made by the Transportation and Facilities Branch, Agricultural Marketing Service, under the Agricultural Marketing Act of 1946.

Price-marking of grocery items in retail food stores has long been a controversial problem. There is no general agreement as to when, where, and how the individual packages should be marked. Also, there is the problem of what type of marking equipment should be used.

A previous study by the T & F Branch indicated that, on the average, the price marking function in self-service stores consumed 22 percent of grocery department man-hours of labor (excluding check-out). Since pricing requires so much time, it is important that the best methods and equipment be utilized.

Although several improved stamping devices are available, some retailers continue to price-mark some or all of their grocery items with a grease pencil or crayon; usually at the display shelf in conjunction with the stocking operation. The crayon or pencil method of price-marking was compared - by actual in-store tests - with use of the band type adjustable stamp and the self-inking, porous tip, stick type stamp, the most common types of price marking equipment. Comparisons also were made with self-inking adjustable band stamps. They were found to be almost identical in time requirements with the band-type adjustable stamp.

In the tests, price marking was performed at the shelf with an entire



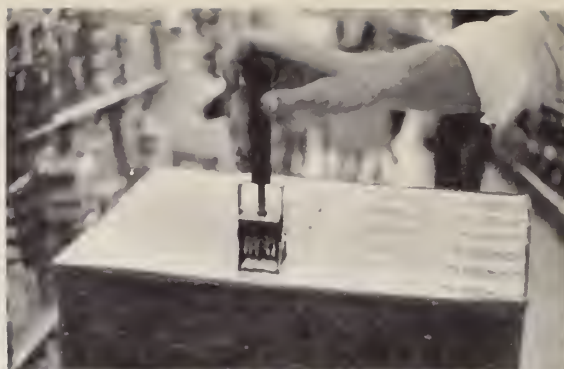
Self-inking stick stamp, fastest price-marking method



Grease pencil price-marking takes most time



Band type stamp and ink pad



Self-inking band type stamp

These methods of price-marking are about equally efficient.

layer from a carton price-marked before any units were placed on the shelf. The price marking operation, as defined in the studies, consisted of:

(1) Positioning the case at the shelf location; (2) opening the case; (3) stamping the merchandise; and (4) other miscellaneous elements relating to the type of equipment used.

When all of these elements were considered, the standard time for the average skilled operator to price mark the average size case of merchandise with a crayon or grease pencil was 1.141 minutes or 19 hours per 1,000 cases. (See table at bottom of page). The crayon or grease pencil method requires 70 percent more labor than the band type adjustable stamp and 121 percent more than the self-inking stick-stamp set.

However, to evaluate accurately various types of price marking equipment, the elements listed above that are not influenced by the equipment itself should be eliminated, that is, items 1 and 2, positioning cases and opening them. Then, the standard time to price mark with grease pencil or crayon was 14.6 man-hours per 1,000 cases. This compared with 6.7 man-hours for the band-type adjustable stamps and 4.1 man-hours for the self-inking stick stamp set. Therefore, crayon and grease pencil marking requires 118 and 256 percent more man-hours, respectively, than the hand-type adjustable stamps and the self-inking stick stamp set.

The major difference between the stick type stamp set and the adjustable stamp is that the time to adjust the band type stamp is considerably longer than the time to select the correct stick stamp.

COMPARATIVE PRODUCTIVITY OF THREE TYPES OF PRICE MARKING EQUIPMENT
IN THE PRICING OF GROCERY ITEMS IN A RETAIL FOOD STORE

Type of Equipment	Complete Price Marking Operation		Price Marking Elements Affected By Type of Equipment	
	Minutes per case	Man-hours per 1,000 cases	Minutes per case	Man-hours per 1,000 cases
Crayon or grease pencil	1.141	19.0	0.881	14.6
Band-type adjustable stamp 1/	.669	11.2	.406	6.7
Self-inking stamp set (100 piece)	.513	8.6	.248	4.1

1/ Productivity was the same for the band-type adjustable stamp and the self-inking band-type adjustable stamp.

Cranberry Care

By W. H. Redit

A seven point program for maintaining quality of early black cranberries shipped long distances in refrigerated railroad cars has been developed through U. S. Department of Agriculture research. Several transit tests from Massachusetts to Chicago, Detroit, and Los Angeles were made last fall by the Biological Sciences Branch, Agricultural Marketing Service, to test the effects of precooling and methods of loading refrigerator cars and types of shipping cartons for consumer packages of cranberries. Recommendations resulting from findings in those tests follow:

1. The time lapse from harvest to loading refrigerator cars should be shortened. Too much time between harvest and shipping increases chances of fruit deterioration and development of decay.

2. Temperature of the fruit should be lowered as soon after harvest as possible.

3. These lower temperatures should be maintained during the post-harvest handling and shipping period.

4. Fruit temperature should be lowered before packaging, if possible, to take advantage of the insulating effect of fiberboard shipping cartons during subsequent handling.

5. Refrigerator car fans should be used in transit to cool packaged fruit, especially if it is warm when loaded. Such cars should be moved as soon after loading as possible to get best use of the fans.

6. Shipping cartons should be ventilated to facilitate cooling of the fruit. Care must be taken to prevent tearing of consumer bags through any ventilation openings in the shipping containers, however.

7. Cars should be loaded to provide some form of air channeling between stacks of shipping cartons to facilitate cooling. Present loading methods and a channel-load pattern used in shipping tests need to be refined and other load patterns should be tried.

A report is being prepared for publication titled "Effects of Precooling, Load Pattern, and Carton Ventilation on Temperature, Moisture Condensation, and Spoiling of Prepackaged Early Black Massachusetts-Grown Cranberries." Participating in the work were Howard W. Hruschka, Asst-ant Physiologist; W. H. Redit, Mechanical Engineer; G. B. Ramsey, Principal Pathologist; M. A. Smith, Pathologist; E. M. Harvey, Sr., Physiologist; E. P. Atrops, Assistant Physiologist, all of the Quality Maintenance and Improvement Section, Biological Sciences Branch, AMS.

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Dairy Marketing in the Northern Great Plains, Its Patterns and Prospects. North Central Regional Publication No. 47. Bulletin 438. May 1954. 59 pp.

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